$5.00

MAINE FLOODPLAIN MANAGEMENT HANDBOOK

A Resource Tool for Land Use Certification in the Code Enforcement Officer Training and Certification Program and A Reference for Other Professionals

(Photo courtesy of Bonnie Boulter)

An elevated structure in the floodplain on U.S. Route 2 along the Androscoggin River in Bethel, Maine. (See inside cover)

CONTAINS ANNOTATED MODEL ORDINANCE

EXECUTIVE DEPARTMENT ~ STATE PLANNING OFFICE
THIRD PRINTING: APRIL, 2002

The most recent revision of this manual was prepared by the Maine Floodplain Management Program in the Executive Department, State Planning Office. Some of the revision material in this handbook comes from the course "Managing Floodplain Development Through the National Flood Insurance Program" established by FEMA and taught at the Emergency Management Institute. The original handbook was prepared with the assistance of the Southern Maine Regional Planning Commission, Box Q, Sanford, Maine 04073 under contract to the Maine Floodplain Management Program. Major components of the handbook are based upon a similar document prepared by the State of Illinois for use by counties and municipalities in that state. The Maine Floodplain Management Program expresses its appreciation to the Illinois Department of Transportation, Division of Water Resources, for permission to modify their product and the support from the SMRPC in earlier revisions.

Funding for this handbook was paid in part by the Federal Emergency Management Agency through the Community Assistance Program/State Support Services Element.

(Photo courtesy of *The Bethel Citizen* newspaper)

The same structure in Bethel on September 17, 1999 experiencing the remnants of Hurricane Floyd. The land area adjacent to this building is a campground.

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(Photo courtesy of John Patriquin/The Portland Newspapers)

Aerial view of the Presumpscot River at Route 302 in Westbrook, Maine on October 22, 1996.

WHAT IS A FLOOD?

Under the National Flood Insurance Program (NFIP), a “flood” or “flooding” is defined as:

a. A general and temporary condition of partial or complete inundation of normally dry land areas from:

   1. The overflow of inland or tidal waters.

   2. The unusual and rapid accumulation or runoff of surface waters from any source.

b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (a)(1) of this definition.

(Photo courtesy of Dick Maxwell, *Morning Sentinel*)

Aerial view of the Kennebec River at Lithgow Street in Winslow, Maine on April 1, 1987.

WHY IS IT IMPORTANT TO MANAGE FLOODPLAINS?

Floodplain Management is a concept that has evolved over the past century to reduce the cost of flooding disasters.

Your community can reduce the loss of life and greatly reduce property damage due to flooding by taking a number of steps.

One of the most important steps is to join the National Flood Insurance Program. This involves adopting a resolution to join the Program, completing a one page application, and adopting an ordinance to regulate development in flood hazard areas. There are no fees to join the Program. The cost of administering the floodplain ordinance is generally offset by the fees charged for permits.

Another important step a community should undertake is proper planning in flood hazard areas. When preparing a comprehensive plan, careful consideration should be given to the floodplains. It is important to guide new development away from the high risk areas. New infrastructure should not be invested in areas that are floodprone. Roads and bridges are very expensive to maintain and replace when damaged by frequent flooding. The repair and replacement costs must be borne by the taxpayers of the town since flood insurance is not available for damages to infrastructure.

Floodplains also serve natural and beneficial functions. Floodplains provide areas for flood waters during periods of heavy runoff and rain. They provide areas for recharging the ground water, as well as providing natural habitat for plants and wildlife. Many cities and towns are also beginning to recognize the recreational value of floodplains.

This Handbook is intended to assist Maine municipalities, individuals, professionals, and citizens who are interested in good floodplain management. It is oriented not only to the purpose of meeting the minimum standards of the National Flood Insurance Program, but also to go beyond the minimum to establish a solid foundation for reducing the risk of flooding in the community.

This manual is in continual revision based on feedback from local officials and other professionals who are concerned about effective floodplain management. If you have concerns, questions, or recommendations, please contact the Maine Floodplain Management staff. We welcome your input.

MAINE FLOODPLAIN MANAGEMENT PROGRAM

There are 5,779 lakes and ponds in Maine.

There are 3,500 miles of coastline in Maine.

There are 2,772 square miles of floodplain in Maine.

Flooding in Maine is largely the result of coastal storms, heavy spring rains, runoff, and ice jams. This flooding has been responsible for millions of dollars of property damage. No private flood insurance is available to insure property against loss from floods; the risk has been found to be too high by private insurers. It has been estimated that there are approximately 33,000 structures at risk of flooding in Maine. Your community can assist citizens in protecting their property from losses due to flooding by joining the National Flood Insurance Program (NFIP). For more information, contact the Maine Floodplain Management Program (MFMP) within the State Planning Office. This Program assists communities throughout Maine in administering the National Flood Insurance Program.

The NFIP is a voluntary program that offers community residents the opportunity to purchase flood insurance provided by the Program in exchange for the community's commitment to practice sound land use management. Currently, there are over 7,000 flood insurance policies in effect in Maine with coverage totaling $874 million[1]. Mortgage loans and disaster assistance are severely limited in communities that do not participate in the NFIP.

The Maine Floodplain Management Program provides technical information, floodplain maps, and model ordinances to communities interested in joining the NFIP, as well as to participating communities. Program staff also provides information about flooding or the NFIP to homeowners, businesses, lenders, Realtors and others. The Program offers workshops on how to read and use flood maps, ordinance interpretation and floodplain management administration. Staff also reviews local ordinances for compliance with the NFIP standards. Assistance is also provided to those communities in the NFIP that exceed the minimum floodplain management standards and that seek to lower their flood insurance premiums through the Community Rating System (CRS). These services are also available from the Federal Emergency Management Agency (FEMA) Regional Office in Boston, as well as from the regional councils across the state. Their addresses and telephone numbers are listed in the front of this handbook.

The Maine Floodplain Management Program is also working with other state agencies to ensure that development which goes through the various state permit reviews is designed and developed to reduce future flood damages. The MFMP works with the Department of Economic and Community Development by reviewing Community Development Block Grants (CDBG) and the Department of Environmental Protection (DEP) and Department of Conservation (DOC) in reviewing development under the provisions of the Natural Resources Protection Act (NRPA) and the site location law.

MAINE FLOODPLAIN MANAGEMENT HANDBOOK

The purpose of this handbook is to enhance the knowledge and skills of those individuals responsible for floodplain management throughout the State of Maine. It is hoped that this manual will broaden the understanding of floodplain management and the need to promote the wise use of one of Maine's vital resources. This manual explains the floodplain regulation requirements of the NFIP. It contains an expanded introduction and seven chapters. It is designed to explain the following components in detail:

Introduction — explains early floodplain development, the objectives of floodplain management, and a detailed history of the NFIP.

[1] NFIP statistical report, February 5, 2002.

Chapter I	describes the Model Floodplain Ordinances that have been prepared by the State Planning Office, with assistance from the Maine Municipal Association and the Attorney General's Office. The ordinance, once adopted, is the legal authority for a community's floodplain regulatory program.
Chapter II	explains the technical data [flood elevations and Flood Insurance Rate Maps (FIRMs)] that define where regulations apply.
Chapter III	discusses exactly what floodplain projects are subject to regulation.
Chapters IV and V	specifies the regulatory standards that development must meet in order to ensure that the objectives of the regulations are achieved.
Chapter VI	describes how a local government puts a regulatory system into place. It explains permitting procedures, administrative requirements, variances and enforcement issues.
Chapter VII	contains additional information related to floodplain management.

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ACRONYMS

ACoE	Army Corps of Engineers
BFE	Base Flood Elevation
BOCA	Building Officials and Code Administrators
CAC	Community Assistance Contact
CAV	Community Assistance Visit
CBRA	Coastal Barrier Resource Act
CBRS	Coastal Barrier Resources System
CEO	Code Enforcement Officer
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CRS	Community Rating System
DEP	Department of Environmental Protection
DOT	Department of Transportation
EO	Executive Order
FBFM	Flood Boundary and Floodway Map
FDIC	Federal Deposit Insurance Corporation
FDPA	Federal Disaster Protection Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHA	Federal Housing Administration
FHBM	Flood Hazard Boundary Map
FIA	Federal Insurance Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FmHA	Farmers Home Administration
FPE	Flood Protection Elevation
FPM	Floodplain Management
FPMO	Floodplain Management Ordinance
GIS	Geographic Information System
GPS	Global Positioning System
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
MEMA	Maine Emergency Management Agency
MFMP	Maine Floodplain Management Program
MRSA	Maine Revised Statutes Annotated
MSL	Mean Sea level
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resource Conservation Service
NSFHA	No Special Flood Hazard Area
NWS	National Weather Service
PL	Public Law
PLS	Professional Land Surveyor
RM	Reference Mark
RPC	Regional Planning Commission
S&L	Savings and Loan
SBA	Small Business Administration
SFHA	Special Flood Hazard Area
SPO	State Planning Office
USC	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VA	Veterans Administration

INTRODUCTION

Rivers and streams are part of nature's system for carrying water from high ground down to the ocean. Floodplains are the part of the system made for carrying unusually large amounts of water, i.e. floods. Flooding is a natural process and floodplains play a vital role in that process.

Under natural conditions, flooding causes little or no damage. Over the years, however, little regard has been given to the original purpose of floodplains. Homes, businesses, and even whole communities have been built in flood hazard areas. This development of floodplains has resulted in continual and, often, severe social and economic loss.

Early decisions to locate in floodplains were in part driven by the fact that the waterways served as a means of transportation. Early settlements relied on river boats and canoes for access to the markets outside their community. Mills were driven by water power which necessitated that the facility be on or near the waters edge to take advantage of the hydropower. Water supply for drinking water and domestic use was often another reason for locating near a water body.

Floodplains also supplied prime agricultural land with fertile, easily tillable soils. For these reasons, many of the major metropolitan areas of the United States were developed adjacent to a major waterway.

More recently, development along waterways and shorelines has been spurred by the aesthetic and recreational values that these sites also offer. Another problem has been the availability of “good” land for development. As many communities have exhausted some of the better low risk areas of the town, increasing pressure is put on local officials to allow development of “less expensive land.”

History has taught us that these locations carried a price.

Along with the benefits, development in such areas has associated costs due to periodic flooding, including:

- Loss of life (national average 150 deaths per year due to flooding),
- Property damage (national average $3 billion per year in flood damages), and
- Disruption of business, community, and individual lives.

Cyclical flooding and the problems created by it gave rise to government involvement in finding solutions to reduce flood losses.

In the early half of the twentieth century the typical governmental responses to flooding (structural flood control and disaster relief) were not totally effective in solving this problem. Despite large governmental expenditures, flood damages throughout the country continued to rise.

Modern floodplain management practices include regulations which control the location and structural characteristics of new construction. This is a more effective way to prevent flood damages from increasing. Rather than try to control flooding that damages properties, government should guide new development away from high risk areas, however, if new construction or improvements must be located in a flood hazard zone, development should be controlled so that flood damages can be avoided.

What is Floodplain Management?

Floodplain Management may be defined as the full range of public and private policy and action to:

- Promote the wise use of floodplains,
- Reduce flood losses, and
- Protect the natural functions and values of floodplains.

It involves:

- Structural measures (such as dams, dikes, and levees),
- Non-structural measures (such as regulations, flood warning and preparedness, and flood insurance),

- Corrective measures to address existing problems, (such as retrofitting) and
- Preventive measures to avoid creating new problems. (such as comprehensive planning and mitigation planning)

The purpose of this manual is to give the reader a better understanding of what his/her community can do to reduce the impacts of flooding not only on the individual but the community as a whole.

Historical Review of Floodplain Management

Throughout the history of the United States, Americans have responded to floods in a variety of ways.

The earliest response was for individuals to bear the losses and the costs of clean up and repair.

In the late 1880s Congress made an initial move by establishing some Federal responsibility for flood forecasting and warning.

Congress Created the Mississippi River Commission in 1879

In 1879 Congress created the Mississippi River Commission and gave control to the Corps of Engineers and directed the Corps to prevent destructive floods.

Flood Control Act of 1917

Direct Federal involvement in flood control began with the passage of the Flood Control Act of 1917, which authorized several specific flood control projects, mostly along the Mississippi River.

Also in 1917, the USDA began making experimental rainfall and runoff measurements which provided the basic concepts and data for development of the rational method for computing maximum runoff.

Flood Control Acts of 1928

Following the Great Flood of 1927, Congress gave the Corps of Engineers more responsibility for flood control and navigation on the Mississippi River.

TVA Act of 1933

This Act established the Tennessee Valley Authority and its regional program of resource development. The TVA established a number of hydro/flood control dams on the inland waterways.

The United States-Mexico Convention of February 1, 1933

Provided for international boundary stabilization and flood control along a 90 mile reach of the boundary section of the Rio Grande.

Flood Control Act of 1936

Significant Federal flood control activity did not begin until the Flood Control Act of 1936 was passed. It was passed in response to a series of major floods on the Potomac, Susquehanna, and upper Ohio River Basins. This Act expanded Federal responsibility to all navigable rivers of the nation and authorized over 200 flood control projects in 31 states.

It further extended the scope of Federal involvement, assigning the Federal government the full cost of building and maintaining dams, channel modifications, levees and floodwalls.

Over the next 50 years, from 1936 to 1986, congress authorized and built approximately 900 flood control projects including approximately 400 flood control dams, thousands of miles of levees, floodwalls,

floodways and improved channels. With a congressional blessing, the Corps of Engineers was charged with the task to keep the water away from the development, in essence, to attempt to conquer nature. Billions of dollars were spent on these structural "improvements".

A well established cycle was now in place:

- Flooding,
- Disaster relief,
- Flood control projects,
- Renewed floodplain encroachment, and
- Repeated flooding.

In spite of the billions spent on flood control projects, flood losses continued to rise rapidly due to extensive and continuing floodplain development. Billions continued to be spent on disaster relief.

Many of these flood control structures had significant adverse impacts on natural resources and environmental quality.

Although Federal efforts in flood control had saved many lives and saved billions in property damage, Congress realized that protective works alone would not stem the increases in flood losses.

In 1952, a bill was drafted to establish a Federal flood insurance program after flooding in 1951, but Congress took no further action.

In 1955, major floods again revived and broadened interest in a national flood insurance program.

Flood Insurance Act of 1956

Congress passed the Flood Insurance Act of 1956 but it was never funded because the property insurance industry continued to oppose such a program due to its impracticability on a business basis.

Then came the 1960s and we started to see a shift in the approach to flooding problems. The concept of keeping the development away from the water was beginning to come to the fore.

House Document 465 - 1966

Congress began to recognize that protective works alone would not stem the increases in flood losses. This led to the creation of a presidential task force on Federal Flood Control Policy and the publication in 1966 of House Document 465, "A Unified National Program for Managing Flood Losses." It included five major goals:

- Improve basic knowledge about flood hazards
- Coordinate and plan new developments in the floodplain
- Provide technical services to managers of floodplain property
- Move toward a practical national program for flood insurance; and
- Adjust Federal flood control policy to support sound criteria and changing needs.

Southeast Hurricane Disaster Relief Act of 1965

At about the same time, Hurricane Betsey killed 74 people in September 1965 and Congress passed the Southeast Hurricane Disaster Relief Act. This Act directed the Secretary of Housing and Urban Development to examine the feasibility of insurance and other programs for financial assistance to flood victims.

The resulting report "Insurance and Other Programs for Financial Assistance to Flood Victims," along with "A Unified National Program for Managing Flood Losses" concluded in 1966 that a national program of

flood insurance was both feasible and in the public interest. This led to the enactment of the National Flood Insurance Act of 1968.

The National Flood Insurance Act of 1968
(The creation of the National Flood Insurance Program)

In 1968 Congress passed the National Flood Insurance Act (42 USC 4001) to correct the shortcomings of traditional flood protection and flood relief programs. The National Flood Insurance Program (NFIP) makes flood insurance available to property owners in communities which agree to adopt an ordinance regulating development in flood prone areas. The combination of development regulations and insurance means that there is help for everyone already living in a floodplain. In addition, new construction is regulated to ensure that it is not subject to flood damage and does not impede or deflect flood flows. Insurance provides relief for even small floods, unlike disaster relief. It also means that floodplain residents are now paying for a greater share of the assistance program. More information about the structure of the NFIP and about flood insurance can be obtained from the State Planning Office or FEMA.

The intent of the NFIP is not to prohibit, but to **guide** development in floodplain areas in a manner consistent with both nature's need to convey flood waters and a community's land use needs. The floodplain regulations required by the NFIP are designed to accomplish two basic objectives related to flood damage protection:

- to prevent new developments from increasing flood damages to others, and
- to ensure that new buildings will be free from flood damage.

There are four basic components to floodplain regulations:

1. The area of the community where the rules apply (the floodplain or "Special Flood Hazard Area") is identified.
2. Certain activities in the floodplain are brought under regulation.
3. The development standards for these activities are specified.
4. A system to administer and enforce the rules is established.

The National Flood Insurance Act has been amended several times since it was enacted in 1968. The following discusses some of those changes.

1973 Flood Disaster Protection Act (FDPA)

In 1972, Hurricane Agnes demonstrated the ineffectiveness of the voluntary 1968 flood insurance program. So in 1973 Congress passed the Flood Disaster Protection Act which tightened the Program by providing sanctions, primarily affecting lending institutions. It was the most significant expansion of both the provisions and the national impact of the NFIP. This Act required:

- Acceleration of Flood Insurance Studies
- Notification to communities of their identification as flood-prone, and
- The creation of the mandatory purchase of flood insurance requirement relative to Federally backed loans.

The notification process appears to be what got our Maine communities to join the Program. In looking at the files, the indications are that most communities joined between 1973 and 1975. The mandatory purchase requirement may have been a significant factor in their decision to join the NFIP.

Any lending institution regulated by a federal instrumentality had to require flood insurance on any loan for a structure in the 100 year floodplain. This included, for example, the FDIC, FSLIC, SBA, VA, and FHA. Today this concept is frequently referred to as "the lender compliance issue".

As a result of the mandatory flood insurance purchase provisions, the NFIP experienced tremendous growth in:

- Community participation, and
- The number of flood insurance policies purchased throughout the 1970s and 1980s.

In Maine, as a result of the April 1, 1987 flood, a study was done by FEMA and it was determined that very few of those structures that should have had flood insurance actually had it. This indicated a lender problem. This along with similar problems in other parts of the country was the beginning of a national effort to increase the lender compliance.

Now, following most major flooding disasters, the federal government does an analysis to see how well the lending institutions did their job in that area. It usually is less than ideal. However, the lenders are now becoming aware of their responsibilities, and current indications appear that they are beginning to be very conservative in their review of flood hazard determinations. If there is a doubt, they are requiring flood insurance. In light of the S&L bailout and the poor performance in the flood insurance arena, the instrumentalities have tightened the reins on the lending institutions. Many municipalities have seen an increase in inquiries and continue to see a rise in outside interest in the NFIP.

More information on lender compliance can be found in the FEMA publication 186, *Mandatory Purchase of Flood Insurance Guidelines* available from the Maine Floodplain Management Program or FEMA Region I.

Coastal Barrier Resources Act of 1983

In 1983, the NFIP was amended again to prohibit new Federal expenditures or the sale of flood insurance in any Coastal Barrier area within the Coastal Barrier Resources System as identified by the Department of Interior. Undeveloped coastal barriers are along the Atlantic and Gulf coasts. The act was called the Coastal Barrier Resources Act of 1983 (also known as CBRA). The requirements are found in Part 71 of the NFIP Regulations. Even though a community participates in the Program, flood insurance is denied in these specially designated areas for any new construction or substantial improvement.

The purpose of CBRA is to reduce the loss of life and property in these hazardous areas and to protect water quality and other coastal resources. The Act includes provisions that:

- Deny Federal assistance (such as grants), flood insurance, and disaster assistance,
- Mandate the avoidance of development in designated high hazard areas,
- Define and identify undeveloped coastal barriers, and
- Place a general prohibition on most Federal activities that might assist development of those barriers.

In 1992, many coastal communities in Maine received new Flood Insurance Rate Maps (FIRMs) because of an expansion in the Department of Interior's Coastal Barriers. Maine state law also prohibits development in Coastal Barriers. Title 38 MRSA §1901-1905.

Stafford Act 1988

The Stafford Act was passed in 1988 and became effective on May 22, 1989. The Robert T. Stafford Relief and Emergency Assistance Act retitled and amended the Disaster Relief Act of 1974. It limits disaster assistance available for damages to under insured or non insured public and non-profit structures.

Section 406(d), Flood Insurance, states that Federal disaster assistance to restore insurable structures in special flood hazard areas will be reduced by the maximum amount of insurance proceeds that would

have been received had the building and contents been fully covered by a standard policy available through the NFIP.

For example, let's say a community is in the Program and the town sewer treatment plant gets damaged to the tune of $200,000, but the community only chose to insure it for $20,000. The disaster assistance is reduced by the amount of additional insurance the community could have bought, which is $180,000, if it had been properly insured.

The 1994 Flood Insurance Reform Act

The National Flood Insurance Reform Act created several major changes in the National Flood Insurance Program. These changes include the following:

- Improves compliance with mandatory purchase requirement and sets monetary penalties
- Creates a new Mitigation Assistance Program
- Increases flood insurance coverage limits
- Increases flood insurance policy waiting period to 30 days
- Creates a new mitigation insurance benefit
- Codifies the Community Rating System
- Requires a study of economic impact of mapping erosion hazard areas
- Prohibits Federal disaster assistance in certain cases where flood insurance has not been maintained
- Requires a study of economic effects of charging actuarially-based premium rates for pre-FIRM structures